years for use in the universal service context, and the underlying algorithms and formulas have all been subject to review by many parties. Most of the algorithms and formulas that the MSM uses are identical to those in the SM. The modifications to the loop module of the MSM that AT&T/WorldCom propose in this proceeding were made available for examination by Verizon and Commission staff. Third, the assumptions in the MSM are verifiable. AT&T/WorldCom generally rely on public data for model inputs and, where no public data were available, they rely on data previously examined by the Commission following a period of public comment. For example, the line count data that AT&T/WorldCom propose to use in the loop module of the MSM are based on Verizon's Automated Reporting Management Information System (ARMIS) data, while the customer location data (for which there is no publicly available source of updated data) are the same data used by the Commission in the SM.

51. Verizon's criticisms of the MSM as an inappropriate TELRIC model fail to undermine a finding that the MSM satisfies these core model criteria. Verizon essentially claims that no version of the SM is capable of being used to generate UNE rates.[157] Verizon's allegation that the Commission has stated that the SM should not be used to generate UNE rates[158] goes too far. In the universal service *Inputs Order*, the Commission cautioned parties against using the nationwide input values, which the Commission adopted for universal service cost comparison purposes, in developing UNE rates.[159] The Commission, however, did not state that the model platform would be inappropriate for use in setting UNE rates.[160] To the extent there are disputes over the appropriate inputs to use in the MSM, we address those issues individually in the loop section of this order.[161]

52. With respect to loops, Verizon's cost study does not meet the model criteria as well as the MSM loop module does. In contrast to the MSM, the Verizon recurring loop cost study is not an economic cost model; it is an engineering cost study based on the Verizon network that exists, or existed in the past, in Virginia, presented in electronic database or spread sheet formats. For example, Verizon uses a survey from 1993 to 1995 to estimate an average loop length for specific distribution areas (DAs) or groups of DAs.[162] For other cost study assumptions, such as structure sharing, fill factors, and plant routes, Verizon also uses figures based solely on its actual experiences and network design.[163] Because of Verizon's extensive use of historical network design and data, its loop cost studies are not as consistent as the MSM loop

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[157] *See* Verizon Initial Cost Brief at 139-40.

[158] *See id.*

[159] *See Inputs Order*, 14 FCC Rcd at 20172, para. 32

[160] *See infra* section IV(B)(2).

[161] *See infra* section IV(C).

[162] *See infra* section IV(B)1.

[163] *See infra id.*

module with the Commission's TELRIC rules, which require "use of the most efficient telecommunications technology currently available and the lowest cost network configurations," limited only by existing wire center locations.[164]

53. There are, moreover, serious issues of transparency and verifiability with the Verizon study, and in particular with the LCAM module. For example, it is not always possible for a third party to adjust the inputs or formulas (*e.g.*, line count data cannot be adjusted in Verizon's loop model).[165] Nor did Verizon provide the underlying source material for all of its inputs. For instance, Verizon has not submitted the loop studies that form the basis for its estimates of the average loop length per wire center, nor has it presented any detailed statistical summary of these loop studies.[166]

54. For similar reasons, we select the Verizon switching cost study, including the SCIS model, to determine switching costs instead of the MSM. The Verizon switching study better satisfies the Commission's TELRIC rules, in part, because it relies on more recent data than does the MSM.[167] AT&T/WorldCom rely on the SM switch cost inputs that were derived from 1989-1996 switching data.[168] Verizon, in contrast, uses switching data from 1996-2000, the most recent data then available.[169]

55. The Verizon switching cost study is also more transparent, adjustable, and verifiable than is the MSM switching module.[170] The most important switching cost inputs are the switch discounts – both the percentage of new versus growth switch equipment and the size of the vendor discounts applicable to each type of switch.[171] As we explain *infra* in the switching section, we find that neither side proposes appropriate new versus growth switch equipment assumptions.[172] We therefore determine independently the appropriate percentages of new and growth switch equipment. Only the SCIS model, and not the MSM, permits the user to modify the growth versus new switch percentages and associated vendor discounts. Further, the specific vendor discount figure used in the MSM is not identified. Thus, for these and other reasons we explain below, we find the Verizon switching cost study preferable to the AT&T/WorldCom

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[164] 47 C.F.R. § 51.505(b)(1).

[165] *See* AT&T/WorldCom Ex. 12, at 19.

[166] *See id.* at 15-16.

[167] *See infra* section V(A)(2).

[168] *See Inputs Order*, 14 FCC Rcd at 20282, para. 299; Verizon Switching Cost Brief at 7.

[169] Verizon Switching Cost Brief at 6.

[170] *See id.* at 3 (citing Tr. at 5129).

[171] *See infra* section V(A)(1).

[172] *See infra* section V(C)(1)(b).

switching cost study.[173]

56. We also adopt the Verizon unbundled transport studies.[174] AT&T/WorldCom submit the MSM only for common transport, not dedicated transport.[175] Verizon, in contrast, submits cost studies for both.[176] AT&T/WorldCom, moreover, support the use of the Verizon dedicated transport study.[177] Both sides assume the use of the same forward-looking technology in their respective common transport studies, and both studies are transparent and permit the user to adjust the inputs.[178] With both studies satisfying the key criteria, we prefer the Verizon cost study because it calculates costs for common and dedicated transport using a consistent network design and consistent cost inputs.[179]

57. Finally, although Verizon is correct that AT&T/WorldCom propose to utilize the MSM to generate rates for only a limited set of UNEs,[180] AT&T/WorldCom generally propose restating the rates generated by the Verizon cost models for other UNEs.[181] Therefore, to the extent that only Verizon submitted a cost study for a particular UNE, we will rely on that study.[182]

C. Cost of Capital

1. Overview

58. In the *Local Competition First Report and Order*, the Commission stated that the objective of a TELRIC pricing methodology is to set prices equal to those a firm would charge in

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[173] *See infra* section V(A)(2). Because signaling is usually purchased only when a competitive LEC also purchases switching, we adopt the Verizon signaling cost study. *See id.*

[174] *See infra* section VI(A).

[175] Tr. at 5551, 5559-62, 5599; AT&T/WorldCom Initial Cost Brief at 188-89; *see also* AT&T/WorldCom Ex. 7 (Turner Direct) at 3; Verizon Initial Cost Brief at 173.

[176] Verizon Ex. 100P, Parts C-9 (common transport) and D-2 (dedicated transport) (confidential version); Verizon Ex. 107, at 212-221.

[177] AT&T/WorldCom Initial Cost Brief at 180, 188-89; *see also* Tr. at 5559-63, 5599.

[178] *See infra* section VI(A).

[179] *See infra* section VI(A)(2).

[180] *See* Verizon Initial Cost Brief at 137-78.

[181] *See* AT&T/WorldCom Ex. 12, at 95-96.

[182] *See infra* section IX.

a competitive market.[183] It decided that TELRIC includes a normal profit equal to the cost of capital.[184] The Commission stated that the "currently authorized rate of return at the federal or state level is a reasonable starting point," and that incumbent LECs "bear the burden of demonstrating with specificity that the business risks they face providing unbundled network elements and interconnection services would justify a different risk-adjusted cost of capital."[185] The Commission went on to say that "[s]tates may adjust the cost of capital if a party demonstrates to a state commission that either a higher or lower cost of capital is warranted."[186] The Supreme Court upheld the Commission's treatment of cost of capital in its decision affirming the Commission's TELRIC rules.[187]

59. In the *Triennial Review Order*, the Commission clarified two aspects of the proper calculation of a cost of capital in a TELRIC proceeding. First, the Commission stated that a TELRIC-based cost of capital should be based on the same set of assumptions regarding technology and competition that are used to calculate network investment.[188] That is, TELRIC pricing is intended to replicate the rates in a market with facilities-based competition, and therefore the cost of capital should reflect the risk of losing customers to other facilities-based carriers.[189] Second, the Commission clarified that a TELRIC-based cost of capital should reflect any unique risks (above and beyond competitive risks) associated with new services that may be provided over certain types of facilities.[190] The Commission suggested that one mechanism for reflecting such risk would be the use of UNE-specific costs of capital.[191]

2. Theory/Policy Issues

60. The overall cost of capital is the minimum rate of return required to attract capital to an investment.[192] It is the rate of return investors expect to receive from alternative

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[183] *See Local Competition First Report and Order*, 11 FCC Rcd at 15846, para. 679 ("Adopting a pricing methodology based on forward-looking economic costs best replicates, to the extent possible, the conditions of a competitive market.").

[184] *Id.* at 15854, paras. 699-700.

[185] *Id.* at 15856, para. 702.

[186] *Id.*

[187] *See Verizon v. FCC*, 535 U.S. at 517-22.

[188] *See Triennial Review Order*, paras. 680-82.

[189] *Id.*, para. 680.

[190] *Id.*, para. 683.

[191] *Id.*

[192] *See* A. LAWRENCE KOLBE, ET AL., THE COST OF CAPITAL, ESTIMATING THE RATE OF RETURN FOR PUBLIC UTILITIES 13 (1986).

investments that have the same risk. The central conceptual issue identified by the parties to this proceeding is what assumptions to make with respect to competition in assessing the risk Verizon faces.

61. Verizon argues that the Commission must make the same assumptions in calculating cost of capital that it makes in calculating network investment.[193] It states that TELRIC assumes more competition than exists today, and it is therefore inappropriate to assume that Verizon will remain the dominant company in the local market.[194] Verizon also argues that the cost of capital should reflect the increased risk of stranded investment associated with the fact that a competitive LEC can use UNEs on a short-term basis before migrating a customer to the competitive LEC's own facilities.[195]

62. AT&T/WorldCom state that the Commission should look at the existing level of competition in calculating cost of capital.[196] They argue that the Commission is not required to use the same assumptions about competition that it uses to calculate network investment because the *Local Competition First Report and Order* requires a cost of capital based on the actual risks faced by an incumbent LEC, not the risks it would face under TELRIC assumptions.[197] This approach assumes that Verizon will remain the dominant carrier in the market for the foreseeable future.[198] AT&T/WorldCom's economist stated on cross-examination, however, that the assumptions underlying the calculation of cost of capital should be consistent with the assumptions used to calculate network investment.[199]

63. After the record in this case closed, the Commission issued the *Triennial Review Order*. In that order, the Commission addressed the issue disputed here. Specifically, the Commission clarified that a TELRIC-based cost of capital should reflect the same competitive assumptions that are used to determine network investment.[200] Based on this clarification, we agree with Verizon that the cost of capital used in this proceeding must reflect the risks of a market in which Verizon faces facilities-based competition, and that AT&T/WorldCom's

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193 Verizon Ex. 104 (Vander Weide Direct), at 8.

194 *Id.* at 8.

195 *Id.* at 10; *see also* Verizon Ex. 111 (Hausman Rebuttal), at 15-17. Although Dr. Hausman suggests that a mark-up of Verizon's costs is needed to compensate for the failure of the TELRIC methodology to consider sunk costs, the prices proposed by Verizon in this proceeding do not reflect this mark-up, and we will consider only the specific cost of capital proposal made by Dr. Vander Weide.

196 AT&T/WorldCom Ex. 10 (Hirshleifer Rebuttal), at 6-7.

197 *Id.* at 4-7.

198 *Id.* at 7, 19-21.

199 Tr. at 3201.

200 *See Triennial Review Order*, paras. 680-82.

assumption that Verizon is, and will remain, the dominant local telephone company cannot form the basis of our cost of capital decisions.

3. Implementation Issues

64. Verizon proposes an overall cost of capital of 12.95 percent[201] and AT&T/WorldCom propose an overall cost of capital of 9.54 percent.[202] In both cases, the overall or weighted average cost of capital (WACC) has three components: (1) cost of debt, (2) cost of equity, and (3) capital structure (*i.e.*, the proportions of debt and equity that the company uses to finance its assets and operations). Although there are only minor differences in the proposed capital structures and costs of debt, there are significant differences in the parties' proposed costs of equity because the parties used different models and different proxy groups. In this order, we will select between the parties' proposals for each of the relevant components, and then calculate a cost of capital based on these selections. Because Verizon's proposed cost of capital of 12.95 percent is closer to the figure we calculate based on these selections, we will use a 12.95 percent cost of capital to calculate UNE rates in this proceeding.[203]

a. Cost of Debt

65. Verizon estimates a 7.55 percent cost of debt using an average yield to maturity analysis of Moody's A-rated industrial bonds for March 2001.[204] Verizon claims that this estimate is conservative because it does not include flotation costs that must be paid to issue debt securities.[205]

66. AT&T/WorldCom state that the best estimate of the cost of debt is the weighted

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[201] Verizon Ex. 104, at 3.

[202] AT&T/WorldCom Ex. 5 (Hirshleifer Direct), at 4.

[203] We note that our decision here is based on the record before us and that applying the same methodology to current data could produce different results. To cite just one example, we note that there has been a significant decline in interest rates since this proceeding started. For example, the 20-year Treasury security yield fell from 5.65 percent in January 2001 to 4.34 percent in June 2003, before rising to 4.92 percent in July 2003. *See* Federal Reserve Statistical Releases, *Selected Interest Rates (H.15) (Government Securities, Federal, Constant Maturity, 20-Year, Monthly)* (visited Aug. 14, 2003) <http.federalreserve.gov/releases/h15/data/m/tcm20y.txt>. The rate on shorter term instruments has fallen even more. For example, the three-month yield during the same period fell from 5.29 in January 2001 to .92 percent in July 2003. *See* Federal Reserve Statistical Releases, *Selected Interest Rates (H.15) (Government Securities, Federal, Constant Maturity, Three-Month, Monthly)* (visited Aug. 14, 2003) <http.federalreserve.gov/releases/h15/data/m/tcm3m.txt>. The rate for AAA corporate bonds also dropped during this same period, from 7.15 percent in January 2001 to 4.97 percent in June 2003, before rising to 5.49 percent in July 2003. *See* Federal Reserve Statistical Releases, *Selected Interest Rates (H.15) (Moody's, Private, AAA Rating, Monthly)* (visited Aug. 14, 2003) <http.federalreserve.gov/releases/h15/data/m/aaa.txt>.

[204] Verizon Ex. 104, at 45.

[205] *Id.*

average cost over all of the subject company's outstanding issues, including the debt of the holding company and any subsidiaries.[206] AT&T/WorldCom estimate a 7.86 percent cost of debt using a yield to maturity analysis of Bell Atlantic and GTE bonds, as listed in Standard & Poor's (S&P) bond guide.[207]

67. We adopt the cost of debt proposed by AT&T/WorldCom. As noted above, the cost of capital calculation is intended to reflect the cost of capital of a telecommunications carrier that operates in a market with facilities-based competition. In this case, Verizon's proposed 7.55 percent is based on a group of companies that generally operate in competitive markets, while AT&T/WorldCom's proposed 7.86 percent is based on an analysis of Bell Atlantic and GTE bonds. We conclude, however, that AT&T/WorldCom's proposal to use the cost of debt for Bell Atlantic and GTE is the better of the two proposals because it at least reflects the cost of companies in the relevant industry.[208] In contrast, Verizon has not demonstrated that the debt costs faced by S&P companies generally are at all related to the costs telecommunications carriers would face in a market with facilities-based competition. Nor are there alternative data in the record that support Verizon's proposal, as we find below with respect to the beta used in calculating the cost of equity.[209]

b. Cost of Equity

(i) CAPM or DCF Model

68. Verizon's cost of equity estimate is based on a constant growth version of the discounted cash flow (DCF) model.[210] The constant growth DCF model holds that a company's cost of equity capital equals the sum of the stock's expected dividend yield and the stock's dividend growth rate, which is assumed to be constant. Verizon estimates the cost of equity capital using this model for a subset of S&P 500 Industrial Firms.[211] Verizon asserts that the S&P Industrials are an appropriate proxy group because they are "a well-known sample of publicly traded competitive companies whose risk, on average, approximates the risk the incumbent LECs actually face in providing telecommunications services in a competitive market."[212]

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206 AT&T/WorldCom Ex. 5, at 9.

207 *Id.*

208 As noted below, the incumbent LEC holding companies operate in a mix of fully competitive businesses (*e.g.*, wireless) and businesses where competition is just emerging (*e.g.*, local telephony). *See infra* para 93.

209 *See infra* paras 91-92.

210 *See* Verizon Ex. 104, at 46.

211 *Id.*

212 *Id.*

69. AT&T/WorldCom estimate the cost of equity capital by averaging estimates derived from the Capital Asset Pricing Model (CAPM) and a three-stage DCF model.[213] The CAPM holds that a company's cost of equity capital equals the expected risk-free rate, plus the product of the expected beta for the common stock and a risk premium reflecting the difference between the expected market rate of return and the expected risk-free rate of return.[214] Beta measures the degree to which a company's stock varies relative to the market as a whole.[215] It represents the systematic or non-diversifiable risk of the stock.[216] AT&T/WorldCom use the CAPM to obtain cost of equity capital estimates for a proxy group of five companies: Verizon, BellSouth, SBC, ALLTEL, and CenturyTel.[217]

70. AT&T/WorldCom apply the three-stage DCF model to Verizon, BellSouth, SBC, and ALLTEL at the holding company-level.[218] They assume that dividends will: (1) increase in the five-year first stage at an annual rate that varies between approximately 11-15 percent, depending on the company; (2) decrease linearly annually in the 15-year second stage until hitting their estimate for the long-term growth rate of the economy; and (3) increase forever in the third stage at the long-term growth rate of the economy.[219]

71. We conclude that the CAPM is the better mechanism for estimating the cost of equity in this proceeding. The CAPM requires three estimates: (1) risk-free rate; (2) risk premium; and (3) beta. Unlike the various DCF models, the CAPM does not rely on assumptions concerning dividend growth rates, and therefore cost of capital estimates derived from the CAPM are no better or worse for companies that are growing rapidly than for those growing slowly.[220]

72. Verizon's only criticism of the CAPM is that the spread between the yield on long-term Treasury bonds and A-rated Industrial and utility bonds has increased since 1998 due to the Treasury's decision at that time to reduce the supply of long-term Treasury bonds, and this has caused CAPM cost of equity results to decline even though telecommunication debt costs

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213 AT&T/WorldCom Ex. 5, at 10-11.

214 *See id.* at 21.

215 *See id.* at 21-22. *See infra* section III(C)(3)(b)(iv) for a detailed discussion of beta.

216 *See* AT&T/WorldCom Ex. 5, at 21-22.

217 *Id.*, Attach. JH-9.

218 *Id.* at 15-19. AT&T/WorldCom did not include CenturyTel in their DCF analysis because it has a small dividend yield and therefore the cost of equity produced with the DCF model is not meaningful. *Id.* at 19 n. 18.

219 *Id.* at 15-16.

220 Modern finance textbooks routinely present the CAPM as an accepted method of estimating the cost of equity capital. *See, e.g.*, RICHARD BREALY AND STEWART MEYERS, PRINCIPLES OF CORPORATE FINANCE 164-73 (2d Ed. 1984).

have remained constant.[221] Efficient capital market theory, however, would hold that bond yields on a given day reflect (at least) all publicly available information and that current yields are the best estimate of future yields.[222] Given the passage of time, bond yields during the period of this proceeding should no longer be anomalously low due to the Treasury's announcement; any lingering effect of the announcement is not an anomaly and is reflected in the CAPM analysis. In addition, as discussed below, we consider both short-term and long-term bonds in developing our cost of equity estimate, which provides a degree of comfort that both estimates are reasonably accurate if they have roughly the same magnitude. We also use the arithmetic average market risk premium calculated over the longest period for which reliable data are available, thereby minimizing the impact of any short-term fluctuation from long-term trend.

73. In contrast to the benefits of using a CAPM analysis, we have identified a number of concerns with each of the DCF analyses presented. For example, the constant growth DCF model advocated by Verizon assumes that dividends will grow at the same rate forever.[223] Typically, regulators have used this type of model to prescribe a cost of capital for utilities.[224] Some utility growth rates years ago may have been relatively stable and roughly the same magnitude as the long-term growth rate of the economy. If the growth rate used in the model is substantially inconsistent with this assumption, however, the finance literature concludes without exception that the model is unlikely to produce an accurate cost of equity capital estimate.[225] Verizon's use of the constant growth DCF model to estimate the cost of equity capital for its S&P proxy group stretches the reasonable limits of its use. AT&T/WorldCom derive an estimate of the long-term economy-wide growth rate of approximately six percent, which is unchallenged by Verizon.[226] For most of its S&P proxy group of firms, Verizon assumes constant growth rates that are higher than AT&T/WorldCom's long-term economy-wide growth estimate. The market value weighted average of the constant growth rates Verizon assumes for its S&P proxy group of firms is approximately 13 percent,[227] a figure that is more than twice AT&T/WorldCom's long-

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[221] *See* Verizon Ex. 112 (Vander Weide Rebuttal), at 59-60.

[222] *See* EDWIN J. ELTON AND MARTIN J. GRUBER, MODERN PORTFOLIO THEORY AND INVESTMENT ANALYSIS 361-405 (3d ed. 1987)

[223] Verizon Ex. 104, at 13-14.

[224] The constant growth DCF model has been widely accepted by regulators for many years. In fact, the Commission derived its current 11.25 percent rate of return prescription using this model. *See Represcribing the Authorized Rate of Return for Interstate Services of Local Exchange Carriers*, CC Docket No. 89-624, Order, 5 FCC Rcd 7507, 7528, para. 178 (1990) ("We have found that RHCs [Regional Holding Companies] are still an appropriate surrogate for LEC interstate access service and that 'classic' DCF estimates for the RHCs should be given the greatest weight in our decision.").

[225] *See* ROGER A. MORIN, REGULATORY FINANCE, UTILITIES' COST OF CAPITAL 111, 123, 143, 156, 231-38 (1994); HAIM LEVY AND MARSHALL SARNAT, CAPITAL INVESTMENT AND FINANCIAL DECISIONS 510-13 (3d ed. 1986).

[226] AT&T/WorldCom Ex. 5, at 17.

[227] Verizon Ex. 104, Attach. A.

term economy-wide growth rate estimate. As AT&T/WorldCom demonstrate, however, no company can grow forever at a greater rate than the economy as a whole,[228] and therefore we conclude that Verizon's assumption is not reasonable.

74. In addition, the results of Verizon's cost of equity capital analysis are inconsistent with its argument regarding the appropriate proxy group. Verizon argues that the S&P Industrial companies are an appropriate proxy group because they operate in fully competitive markets, as opposed to the incumbent LEC parent companies, which, according to Verizon, presently operate in less risky markets than the Commission's TELRIC rules assume.[229] Yet Verizon derives a 14.75 percent cost of equity capital for its S&P 500 proxy companies, and a 15.52 percent cost of equity capital for the four incumbent LEC parent companies in the S&P proxy group, ALLTEL, BellSouth, SBC, and Verizon.[230] As Verizon acknowledges, however, common sense holds that the cost of capital should be high for companies that face high risk and low for companies that face low risk.[231] Consequently, either Verizon is incorrect that the incumbent LEC parent companies face less risk than the S&P Industrial companies, or there is some flaw in its DCF model. Because Verizon's statements regarding the relative risks of incumbent LECs and S&P Industrial companies are consistent with other information in the record (*e.g.*, information on the betas for the various companies),[232] it appears that Verizon's DCF model does not accurately capture the risks faced by different types of companies.

75. AT&T/WorldCom's DCF model has similar flaws. For example, they offer no explanation or evidence supporting the magnitude or the pattern of the growth rate assumptions beyond the fifth year.[233] There are an unlimited number of different growth rate estimates that could be used in such a DCF model. Different growth rate estimates, even among those that might be considered reasonable, could produce significantly different cost of equity capital estimates. The cost of equity capital estimate derived from a three-stage DCF model is only as accurate as the assumptions on which the model relies. There is no basis on which to find that AT&T/WorldCom's three-stage DCF model produces a reasonable cost of equity capital estimate, given the lack of support for their dividend growth rate assumptions.

76. Moreover, like the Verizon DCF model, the AT&T/WorldCom DCF model produces results that are inconsistent with expectations regarding the risks of different types of companies. Verizon states that the AT&T/WorldCom DCF model produces lower cost of equity

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[228] AT&T/WorldCom Ex. 10, at 13.

[229] Verizon Ex. 104, at 40-41, 46.

[230] *Id.* at 47.

[231] Verizon Ex. 118 (Vander Weide Surrebuttal), at 40-41.

[232] *See* Verizon Ex. 192 (Verizon response to record request no. 12 (requested Oct. 25, 2001)).

[233] AT&T/WorldCom Ex. 5, at 16-17.

estimates for high-risk companies than it does for low-risk companies.[234] Specifically, Verizon notes that the AT&T/WorldCom DCF model produces a lower rate for the S&P 500 companies than for LECs, and that the estimates for both of these groups are lower than the cost of equity estimates for electric and gas utilities.[235] Verizon states that there is no rational explanation for these results other than flaws in the DCF model.[236] We agree with Verizon that these results are indicative of flaws in the AT&T/WorldCom DCF model. Based on these factors, we select the CAPM and consider its terms in the following paragraphs.

(ii) Risk-Free Rate of Return

77. The risk-free rate, the first term in the CAPM, is the rate of return an investor could obtain if it faced no risk. AT&T/WorldCom developed two separate CAPM cost of equity capital estimates using as the risk free rate: (1) the expected 30-day Treasury bill rate; and (2) the 20-year Treasury bond rate.[237] The expected 30-day Treasury rate that AT&T/WorldCom use is 4.93 percent,[238] and the 20-year Treasury bond rate that they use is 6.26 percent.[239] Verizon re-stated AT&T/WorldCom's CAPM study using different estimates for beta and the risk premium, but it used AT&T/WorldCom's 20-year Treasury bond estimate for the risk-free rate in that re-statement.[240]

78. The parties have identified some concerns with both the 30-day Treasury bill rate and the 20-year Treasury bond rate. The 30-day Treasury bill rate has almost no default risk and little interest rate risk. It therefore is the closest proxy for a risk-free rate. The 30-day Treasury bill may fluctuate widely, however, resulting in fluctuating and unreliable cost of equity capital estimates. Moreover, the maturity period of the 30-day Treasury bill does not match the long-term horizons of equity investors. Finally, the 30-day Treasury bill will not reflect factors (*e.g.*, inflation) in the same way that a long-term security such as a common stock will.

79. The use of a long-term bond rate as the risk-free rate avoids the problems associated with the use of the 30-day Treasury bill. Long-term Treasury bonds are almost risk free for investors that have long-term investment horizons. They are less volatile than 30-day Treasury bills, reflect long-term inflation expectations, and have an investment horizon that matches more closely those of common stock investors than that of the 30-day Treasury bill.

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234 Verizon Ex. 118, at 40-41.

235 *Id.* at 41.

236 *Id.* at 43-47.

237 AT&T/WorldCom Ex. 5, at 26.

238 *Id.* at 33.

239 *Id.*

240 Verizon Ex. 112, at 60.

The only alleged problem with the 20-year Treasury bond was previously identified by Verizon, *i.e.*, that the rate is not representative of the true risk-free rate due to the Treasury's 1998 decision to reduce the supply of long-term bonds.[241] As noted above, we rejected Verizon's argument on this point.[242]

80. Although we conclude that either a short-term or long-term rate could be used, we will adopt AT&T/WorldCom's proposal and estimate the cost of equity capital twice – once using the 4.93 percent expected 30-day Treasury bill rate and once using the 6.26 percent 20-year Treasury bond rate – and then average the results.

(iii) Market Risk Premium

81. The market risk premium component of the CAPM reflects the difference between the expected rate of return for the market as a whole and the expected risk-free rate of return. AT&T/WorldCom use two sources of information to estimate the market risk premium. First, they rely on the difference between Merrill Lynch's expected return on the market and the expected yields on the one-month and the 20-year Treasury securities.[243] Second, AT&T/WorldCom rely on both arithmetic and geometric average historical differences between realized stock market and Treasury security returns over several different time periods.[244] Using these data sources, AT&T/WorldCom derive a market risk premium of 7.5 percentage points for the one-month Treasury bill and 5.5 percentage points for the 20-year Treasury bond.[245]

82. Verizon uses the Ibbotson Associates arithmetic average risk premium for stocks over long-term government bonds for the period 1926-1999, 8.10 percent, to restate AT&T/WorldCom's CAPM study.[246] Verizon argues that AT&T/WorldCom's use of geometric average differences, rather than arithmetic averages, is not defensible, nor is the use of a time period that includes periods prior to 1926.[247]

83. We adopt Verizon's recommended approach of using data from Ibbotson Associates, but we will use two risk premiums, one for the 30-day Treasury bill and one for the 20-year Treasury bond. For the reasons explained above, the market risk premium should be based on the average excess of the market rate of return over the risk-free rate over the longest

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241 *Id.* at 59-60.

242 *See supra* para. 72.

243 AT&T/WorldCom Ex. 5, at 27-29.

244 *Id.* at 29-32, Attach. JH-8.

245 *Id.* at 32.

246 Verizon Ex. 112, at 60.

247 *Id.* at 52-56.

period for which reliable data are available. Ibbotson Associates publishes risk premiums that are widely used. Verizon uses the Ibbotson Associates arithmetic average risk premium for stocks over long-term government bonds for the period 1926-1999, 8.10 percent, to re-state AT&T/WorldCom's CAPM study.[248] AT&T/WorldCom uses Ibbotson Associates' arithmetic average risk premium for stocks over 30-day Treasury bill returns for the period 1926-1999, 9.45 percent, in one of their CAPM specifications.[249] We also note that AT&T has relied on the Ibbotson Associates historical risk premium for government securities, either in whole or in part, in the CAPM analyses it has undertaken to estimate the cost of capital for evaluating real-world business projects.[250]

84. In addition to the Ibbotson Associates data, AT&T/WorldCom's market risk premium calculation relies in part on Merrill Lynch's expected rate of return to estimate the risk premium, but they do not explain or document how Merrill Lynch derives this number. Accordingly, we give this estimate no weight in developing the correct risk premium to use in a CAPM analysis. AT&T/WorldCom also rely in part on the geometric average historical risk premium to develop the risk premium they use in their CAPM analysis. As Verizon notes, most cost of capital experts agree that the arithmetic historical average, not the geometric historical average risk premium, should be used in the CAPM analysis.[251] In statistical terms, the arithmetic average, not the geometric average, is the unbiased measure of the expected value of repeated observations of a random variable. Use of the geometric average produces a smaller risk premium and a lower cost of capital compared to use of the arithmetic average.

85. AT&T/WorldCom also rely in part on historical data from as far back as 1802.[252] As Verizon notes, however, many cost of capital experts agree that it is appropriate to use the longest period for which reliable return data are available to calculate the risk premium in a CAPM analysis, but that reliable data on stock market returns were not available until approximately 1926.[253] The historical risk premium approach assumes that average realized return is a proxy for expected return. Realized returns may vary substantially from anticipated returns over short periods, but the two coincide over very long periods, such as from 1926-present.[254] Giving weight to shorter periods than 1926-present produces a smaller risk premium

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[248] *Id.* at 60.

[249] AT&T/WorldCom Ex. 5, Attach. JH-8.

[250] Letter from Mark A. Keffer, AT&T Chief Regulatory Counsel, Atlantic Region, to Magalie R. Salas, Secretary, FCC, CC Docket Nos. 00-218, 00-251, at response no. 6 (requested Oct. 24, 2001) (filed Dec. 12, 2001) (Keffer Dec. 12 Letter).

[251] Verizon Ex. 112, at 54-58.

[252] AT&T/WorldCom Ex. 5, Attach. JH-8

[253] Verizon Ex. 112, at 57-58.

[254] *See* MORIN, *supra* note 225, at 313-14.

and a lower cost of capital compared to use of the longer period.

86. Based on our decision to use two risk-free rates of return, it follows that we must use two market risk premiums. Specifically, we will use the 9.45 percent risk premium together with the 4.93 percent expected 30-day Treasury bill rate, and the 8.10 percent risk premium together with the 6.26 percent 20-year Treasury bond. Using the beta selected below, we will calculate two costs of equity, which we will average to obtain a final result.

(iv) Beta

87. Beta measures the degree to which a company's stock price varies relative to the market as a whole, *i.e.* it represents the systematic or non-diversifiable risk of the stock.[255] A company has a beta equal to 1.0 if its stock price changes over time to the same degree as stock market prices change in the aggregate. A company that has a beta equal to 1.0 has the same risk as the market. A company has a beta greater than 1.0 if its stock price changes over time to a greater degree than stock market prices change in the aggregate, *i.e.*, if it has greater risk than the market. A company has a beta less than 1.0 if its stock price changes over time to a lesser degree than stock market prices change in the aggregate, *i.e.*, if it has less risk than the market. Selection of a beta is the most difficult aspect of the cost of capital calculation because there is no real-world company that provides UNEs in the type of competitive market assumed under the Commission's TELRIC rules, and therefore no real-world company's beta precisely reflects the risk of participating in such a market.

88. Verizon proposes calculating the cost of equity capital using an S&P 500 proxy group of companies, to reflect the competitive assumptions implicit in the Commission's TELRIC rules.[256] Although Verizon does not advocate using the CAPM, it did restate AT&T's CAPM analysis using Value Line betas for 365 S&P 500 companies.[257] The market value weighted average Value Line beta for these companies is 1.05, while the simple average beta is 1.00.[258] Verizon also placed Value Line betas into the record for BellSouth (.85), SBC (.85), ALLTEL (.75), and CenturyTel (.95).[259] The market value weighted average beta for these companies is .85, and the simple average also is .85.[260] Verizon also placed into the record the

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[255] *See* AT&T/WorldCom Ex. 5, at 21-22.

[256] Verizon Ex. 104, at 46-47.

[257] Verizon Ex. 112, at 60. Value Line is an investment advisory service that provides information on betas for public companies.

[258] *See id.* at 60.

[259] *See* Verizon Ex. 192.

[260] *See* Verizon Ex. 112, at 51.

Value Line beta for AT&T, .95.[261]

89. AT&T/WorldCom propose calculating the cost of equity capital using a proxy group of large incumbent LEC holding companies, to reflect the competitive risks an incumbent LEC faces today.[262] They use BARRA betas for BellSouth (.65), Verizon (.68), SBC (.83), ALLTEL (.74), and CenturyTel (.84).[263] The market value weighted average BARRA beta for these companies is .73, while the simple average is .75.[264] These are "levered" betas, which means they have been adjusted to reflect the capital structure used in AT&T/WorldCom's analysis.[265]

90. Although we do not agree with the rationale underlying Verizon's proposal, we conclude that it is reasonable to use Verizon's proposed beta of 1.0 to develop the cost of capital in this proceeding. The businesses of most of Verizon's S&P 500 proxy group of companies have no obvious similarity to the provision of local exchange services, and Verizon did not describe any. Consequently, there is no basis on which to conclude that this proxy group best represents the risks that Verizon would face if it faced facilities-based competition. Nevertheless, the overall beta of 1.0 for the S&P 500 companies for which Verizon placed betas into the record does produce a useful benchmark for the risk faced on average by established companies in competitive markets. Absent evidence of any unique risks associated with the telecommunications industry, or a particular segment of the industry, we would be uncomfortable prescribing a cost of equity capital for UNEs that is based on a beta significantly higher or lower than the average beta for companies that face competition.

91. Moreover, based on the information in the record regarding the betas of interexchange carriers (IXCs), a beta of 1.0 appears to represent a reasonable estimate of the risk faced by a company such as Verizon in a market with facilities-based competition. The long-distance companies for which we have betas (AT&T and (pre-bankruptcy) WorldCom) build, own, operate, and maintain long distance networks.[266] The assets they use, activities they perform, and functions they provide are comparable, but not identical, to incumbent LEC assets, activities, and functions. Moreover, they operate these assets in an environment that clearly is competitive, with a number of ubiquitous facilities-based competitors. Although there are obvious differences between the local exchange market and the interexchange market, the betas

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[261] *See* Verizon Ex. 192.

[262] AT&T/WorldCom Ex. 5, at 40. Indeed, AT&T/WorldCom argue that the current risk of an incumbent LEC holding company overstates the risk associated with providing UNEs. *Id.* at 40-43.

[263] *Id.*, Attach. JH-5. Like Value Line, BARRA is an advisory service that provides information on betas for public companies.

[264] *Id.*

[265] *See id.* at 25.

[266] *See* Verizon Ex. 192; Keffer Dec. 12 Letter, at response no. 6 (beta for WorldCom and MCI is 1.03).

of the IXCs are a relevant proxy group for us to consider in attempting to quantify risk in a TELRIC proceeding.

92. We draw further support for the use of a beta of 1.0 from the evidence regarding the betas used by AT&T in making internal investment decisions. AT&T has used the CAPM to derive the cost of equity capital for evaluating long distance, wireless, and cable TV projects.[267] For these purposes, it used a beta equal to 1.03, based on the weighted average of the betas for WorldCom and MCI developed from a variety of sources.[268]

93. We find AT&T/WorldCom's proposal to use a beta based solely on a proxy group of incumbent LECs unpersuasive in light of some of the important factors not reflected in the incumbent LECs' betas. Their betas may be thought of as a weighted average of the betas for each line of business in which they operate. Although the incumbent LECs' current betas do reflect some risk associated with their participation in competitive markets, such as wireless, those betas likely understate the risk of selling UNEs in a competitive market because the incumbent LECs continue to operate as regulated monopolies or near-monopolies in many of their markets. For example, approximately 58 percent of Verizon's year 2000 consolidated revenues are attributable to operating telephone company regulated services.[269] In contrast, the assumption required under the Commission's TELRIC rules, *i.e.*, that the incumbent LEC faces or potentially faces a ubiquitous competitor that uses only the most efficient technology and network configuration, does not reflect the current local exchange market. The TELRIC cost of capital would have to reflect the risk of participating in such a market.[270]

94. Similarly, the current betas for the incumbent LECs may not reflect the risk that an incumbent LEC will not be able to recover the initial capital outlay for an asset if any anticipated decreases in asset prices over time are not factored into the depreciation allowance. As the Commission found in the *Triennial Review Order*, if equipment prices are declining, an incumbent LEC needs to recover more of its investment in an asset during the early years of the asset's life and less in the later years in order to compete effectively with a subsequent entrant that pays less for the same asset.[271] Even if there is no new entry, but the cost of an asset is continuously decreasing, an incumbent LEC would not recover the initial capital outlay for the asset if regulators at each rate proceeding establish successively lower UNE prices based on the

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[267] Keffer Dec. 12 Letter, at response no. 3.

[268] *Id.*, at response no. 6. The 1.03 beta is a "re-levered" beta, *i.e.*, one that is adjusted to reflect the capital structure that AT&T used in its analysis, 10 percent debt and 90 percent equity, as opposed to the capital structure of WorldCom and MCI. AT&T included a 1 percentage point premium in its cost of capital estimate to "provide a margin of safety." *Id.*, at response no. 3. That is, using a beta of 1.03 in CAPM produced a WACC of 14.31 percent, but AT&T used a cost of capital of 15.31 percent in analyzing investment opportunities.

[269] *See* Verizon Ex. 186 (Verizon response to record request no. 6 (requested Oct. 24, 2001)).

[270] *Triennial Review Order*, paras. 680-82.

[271] *Id.*, para. 690.

application of straight line depreciation to lower asset prices.[272]

95. Beyond the general problems inherent in using incumbent LEC betas to calculate a TELRIC cost of capital, we have additional problems with the specific betas proposed by AT&T/WorldCom. AT&T/WorldCom use beta and risk premium estimates in their CAPM analysis developed by BARRA, a consulting firm.[273] BARRA is not nearly as well known or widely circulated as Value Line, and it is unlikely to have nearly as much influence on the expectations of investors.[274] Value Line perhaps is the largest and most widely circulated investment advisory service, and it exerts influence on a large number of institutions and individual investors and on the expectations of these investors.[275] In making its own capital budgeting decisions, it is noteworthy that AT&T relies in part on Value Line betas, but not at all on BARRA betas.[276] Accordingly, we will not rely on the BARRA betas proposed by AT&T/WorldCom in this case.

(v) Flotation Costs

96. Flotation costs are the costs associated with issuing securities, including underwriters' commissions, legal fees, and printing expenses. Verizon states that these costs, which often are deducted from the proceeds of an offering, typically represent three to five percent of the amount of the proceeds.[277] In addition, Verizon states that there is a decline in stock price associated with the sale of new securities that has been estimated at two to three percent.[278] Verizon believes a five percent flotation cost allowance is a conservative estimate to

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[272] Verizon also argues that a significant portion of local exchange network investment is sunk and irreversible, and that entrants that buy unbundled networks on a month-to-month basis bear none of the risk associated with these investments while the incumbent LEC bears all of it. Verizon Ex. 111, at 9. As a result, according to Verizon, there is a "real options" effect as the competitive LEC receives a risk-free ride on the incumbent LEC's network. *Id.* AT&T/WorldCom disagree completely. AT&T/WorldCom Ex. 20 (Murray Surrebuttal), at 4-33. Given our decision to adopt Verizon's proposed cost of capital, we need not resolve this dispute.

[273] *See* AT&T/WorldCom Ex. 5, at 23-25.

[274] *See* MORIN, *supra* note 225, at 65.

[275] In addition, the BARRA betas are derived by estimating a multiple regression equation specifying that beta is a function of many different independent variables. More typically, beta is measured based on simple regression analysis of changes in a company's stock market price and changes in a broad stock market average price over time. Value Line is among those financial companies that use the simple regression analysis. It also adjusts its betas to account for their long-term tendency to converge to 1, a routine practice among investment services that publish betas. *Id.* at 65, 67-68. Numerous studies have found that betas do regress over time to 1.00. *Id.* at 67-68. This is a compelling reason for using betas that are so adjusted.

[276] Keffer Dec. 12 Letter, at response no. 6.

[277] Verizon Ex. 112, at 47.

[278] *Id.*

include in a DCF model.[279]

97. AT&T/WorldCom did not include a separate flotation cost allowance. AT&T/WorldCom contend that these costs already are anticipated by the market and that including an allowance would provide a double recovery.[280] They also argue that Verizon has in fact issued very little stock in recent years, and is not expected to do so in the foreseeable future, and that, therefore, there is no need to compensate Verizon for flotation costs.[281]

98. Given our conclusion below that the record in this proceeding supports Verizon's proposed cost of capital, we need not resolve the question of whether to include, and how to quantify, flotation costs.

(vi) Cost of Equity Capital Estimate

99. In the CAPM, the overall cost of equity capital equals the expected risk-free rate, plus the product of the expected beta for the common stock and a risk premium reflecting the difference between the expected market rate of return and the expected risk-free rate of return.[282] Based on the analysis above, we will calculate two different cost of equity figures and use the average of the two in developing an overall cost of capital. First, using the 30-day Treasury bill, the cost of equity equals 4.93 + 9.45 (1.0), or 14.38. Second, using the 20-year Treasury bond, the cost of equity equals 6.26 + 8.10 (1.0), or 14.36. We will use the average of the two, 14.37, in developing the overall cost of capital.[283]

c. Capital Structure

100. Verizon recommends a capital structure of 25 percent debt and 75 percent equity, based on a proxy group of S&P Industrials and telephone holding companies over a five-year period.[284] Verizon argues that AT&T/WorldCom's use of a capital structure based on book value is not forward-looking and not consistent with TELRIC.[285]

101. AT&T/WorldCom recommend a capital structure of 34.5 percent debt and 65.5

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[279] *Id.* at 48.

[280] AT&T/WorldCom Ex. 17 (Hirshleifer Surrebuttal), at 37.

[281] *Id.* at 38.

[282] *See* AT&T/WorldCom Ex. 5, at 21.

[283] As discussed in the next section, it will be necessary to use an implied cost of equity of 14.22 percent in running the cost models in this case.

[284] Verizon Ex. 104, at 44-45.

[285] Verizon Ex. 112, at 27-28.

percent equity by using a mid-point WACC estimate.[286] The WACC formula was applied using book and market average weights.[287] AT&T/WorldCom argue that a company with low operational risk can afford the risk associated with more debt in its capital structure, and that Verizon's assumption of less debt is inappropriate given the low risk associated with wholesale provision of network elements.[288]

102. We will use Verizon's proposal as the starting point in determining the appropriate capital structure in this case. In calculating TELRIC prices, the theoretically correct capital structure is based on market values of debt and equity, not book values. In section 252(d)(1) of the Act, Congress specifically prohibited the use of traditional rate-base, rate-of-return ratemaking.[289] The Commission has interpreted this section to require prices based on forward-looking costs, because forward-looking costs best replicate the costs a carrier would face in a market with facilities-based competition.[290] Under the Commission's TELRIC rules, we calculate the investment necessary to build a network using the most efficient technology currently available.[291] The TELRIC rules provide for the recovery of the investment in that efficient network through the use of economic depreciation and they provide for a return on that investment through a risk-adjusted cost of capital.[292] The book value of Verizon's existing network is irrelevant for these purposes. Investors would not earn the return that they require if a cost of capital that is based on book value is applied to the economic value of their assets, given that rational investors value these assets at market value. Thus, the use of a capital structure based on market values, rather than book values, represents a departure from traditional ratemaking, but one that is entirely appropriate under the Act.[293]

103. Verizon proposes use of a 75 percent equity/25 percent debt capital structure, based on 1996-2000 data showing that this ratio was no less than 86 percent for the S&P Industrials and 78 percent for telecommunications companies.[294] AT&T/WorldCom estimate

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[286] AT&T/WorldCom Ex. 5, at 39.

[287] *Id.* at 36-37.

[288] *Id.* at 37.

[289] 47 U.S.C. § 252(d)(1).

[290] *See Local Competition First Report and Order*, 11 FCC Rcd at 15846, para. 679.

[291] 47 C.F.R. § 51.505(b)(1); *Local Competition First Report and Order*, 11 FCC Rcd at 15848-49, para. 685.

[292] 47 C.F.R. § 51.505(b)(2), (3); *Local Competition First Report and Order*, 11 FCC Rcd at 15856, paras. 702-03.

[293] We note that AT&T/WorldCom do not argue that a capital structure based on market value is incorrect as a matter of theory. Rather, they argue that in this case it does not reflect the relevant risk of providing UNEs. *See* AT&T/WorldCom Ex. 5, at 36-37. As we explained above, we think Verizon's assessment of the relevant risk is more consistent with the requirements of TELRIC than is AT&T/WorldCom's.

[294] Verizon Ex. 104, at 44-45.

that this ratio for incumbent LECs, based on book value weights, is 49 percent/51 percent. They determine that this ratio is 80 percent/20 percent based on market value.[295] For the reasons described above, we give no weight to the portion of AT&T/WorldCom's proposal that is based on incumbent LECs' book value capital structure. Based on the data on which the parties estimated their market value-based capital structures, a range of 78-80 percent equity and 20-22 percent debt could be justified. Therefore, as between the two proposals presented in this case, Verizon's 75 percent equity/25 percent debt is the better choice. Using this ratio, however, would create a mismatch with the data we use to calculate the cost of equity because those data assume an 80 percent/20 percent equity/debt ratio.[296] To be consistent, it is necessary for us to depart slightly from baseball arbitration and use an 80 percent/20 percent equity/debt ratio.

d. Overall Cost of Capital

104. In our analysis above, we have selected a 7.86 percent cost of debt, a 14.37 percent cost of equity capital, and a capital structure that is 20 percent debt and 80 percent equity to estimate the cost of capital for UNEs. The WACC under these assumptions is 13.068 percent. Accordingly, as between the two proposals presented in this case, using baseball arbitration we adopt the 12.95 percent overall cost of capital proposed by Verizon to develop UNE rates.[297]

D. Depreciation

1. Overview

105. Depreciation is the mechanism by which the investment in an asset is recovered over the life of the asset. The *Local Competition First Report and Order* contains a limited discussion of depreciation. Specifically, the Commission stated that properly designed depreciation schedules should take into account expected declines in the value of goods.[298] The Commission's rules simply require the use of "economic depreciation."[299] In upholding the TELRIC rules, the Supreme Court found that existing regulatory depreciation rates were an appropriate starting point that could be "adjusted upward if the incumbents demonstrate the need."[300]

106. There are two components of depreciation – the useful life of the asset, and the

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[295] AT&T/WorldCom Ex. 5, at 36.

[296] *See supra* paras. 88-89.

[297] To achieve a 12.95 percent overall cost of capital, an implied cost of equity of 14.22 percent should be used in lieu of the 14.37 percent identified above when running the MSM and the Verizon cost models.

[298] *See Local Competition First Report and Order*, 11 FCC Rcd at 15849, para. 686.

[299] 47 C.F.R. § 51.505(b)(3).

[300] *Verizon v. FCC*, 535 U.S. at 519.

rate at which the asset is depreciated over the useful life. In a recent decision addressing the issue of asset lives, the Commission noted that more than twenty states have used FCC regulatory lives in calculating TELRIC-based UNE prices.[301] In the same decision, the Commission expressed some concerns about the use of asset lives used in financial reporting, although it did permit incumbent LECs to seek waivers that would allow them to use financial book lives.[302] That decision did not, however, specifically consider whether FCC regulatory lives or financial book lives are more appropriate for use in a TELRIC calculation. In the *Universal Service* proceeding, the Commission used FCC regulatory lives in running the SM.[303] In its section 271 decisions, the Commission has found both FCC regulatory lives and financial book lives to be consistent with TELRIC principles.[304] Similarly, in the *Triennial Review Order*, the Commission declined to mandate one set of asset lives or the other.[305]

107. As to the timing of recovery over the life of an asset, the *Triennial Review Order* clarifies that, under the Commission's "economic depreciation" requirement, a carrier may accelerate recovery of the initial capital outlay for an asset over its life to reflect any anticipated decline in its value.[306] For example, an approach that accelerates cost recovery based on an index showing that equipment prices are declining over time may be consistent with the requirement to use economic depreciation.[307] Recovering more of the initial capital outlay for the asset in the early years would enable a carrier to recover less in later years, thereby allowing it to compete with carriers that have purchased new, lower-priced equipment in those later years.

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[301] *See 1998 Biennial Review – Review of Depreciation Requirements for Incumbent Local Exchange Carriers*, CC Docket No. 98-137, Report and Order, 15 FCC Rcd 242, 257, para. 33 (1999) (*Biennial Review Depreciation Order*).

[302] *See id.* at 262-63, para. 48 ("We believe that giving incumbent LECs the right to select, for regulatory purposes, any depreciation rate allowed by GAAP [Generally Accepted Accounting Principles] is inappropriate as long as incumbent LECs reserve the right to make claims for regulatory relief based on the increased depreciation that would result from granting them that flexibility."); *id.* at 252-53, para. 25 (establishing waiver requirements).

[303] *See Inputs Order*, 14 FCC Rcd at 20344, para. 426.

[304] *See, e.g., Application by Verizon New England Inc., Bell Atlantic Communications Inc. (d/b/a Verizon Long Distance), NYNEX Long Distance Company (d/b/a Verizon Enterprise Solutions), Verizon Global Networks Inc., and Verizon Select Services Inc., for Authorization To Provide In-Region, InterLATA Services in Rhode Island*, CC Docket No. 01-324, Memorandum Opinion and Order, 17 FCC Rcd 3300, 3317, para. 30 (2002) (FCC lives) (*Rhode Island 271 Order*); *Joint Application by SBC Communications Inc., Southwestern Bell Tel. Co., and Southwestern Bell Communications Services, Inc., d/b/a Southwestern Bell Long Distance for Provision of In-Region, InterLATA Services in Kansas and Oklahoma*, CC Docket No. 00-217, Memorandum Opinion and Order, 16 FCC Rcd 6237, 6274, paras. 76 (2001) (financial lives) (*Kansas/Oklahoma 271 Order*), *aff'd in part, remanded in part sub nom. Sprint Communications Co. v. FCC*, 274 F.3d 549 (D.C. Cir. 2001).

[305] *Triennial Review Order*, para. 688.

[306] *Id.*, para. 690.

[307] *Id.*

2. Background

108. Verizon advocates the use of financial reporting lives based on Generally Accepted Accounting Principles (GAAP).[308] It states that GAAP lives are appropriate for use in a TELRIC model because they are reassessed annually to reflect the true economic life of the assets.[309] Verizon argues that GAAP lives are reasonable because they are comparable to those used by competitive companies, such as IXCs and cable operators,[310] and they are longer than the lives suggested in a study prepared by Technology Futures, Inc. (TFI).[311] Verizon also argues that the use of FCC regulatory lives is not appropriate in the context of UNE pricing because the FCC regulatory lives were determined before the 1996 Act and could not possibly reflect the competitive and technological environment assumed under TELRIC.[312] Verizon argues that competition reduces the life of an incumbent LEC's assets and increases the risk that assets will become obsolete before the full investment is recovered.[313]

109. Verizon asserts that the MSM proposed by AT&T/WorldCom fails to take account of the change in price of capital goods, which is an important element of economic depreciation.[314] For example, Verizon identifies central office switches and fiber optic carrier systems as types of equipment that have experienced declining prices in recent years.[315] According to Verizon, failure to reflect declining prices in the depreciation calculation will result in an understatement of depreciation expense, and TELRIC rates that are too low.[316] Similarly, Verizon states that the periodic revaluation of assets required by TELRIC means that carriers must recover more of their investment in the early years of an asset's life in anticipation of possible price reductions in the next rate proceeding.[317] Although Verizon witness Dr. Hausman suggests that this problem can be addressed by including a mark-up in the MSM to account for

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[308] Verizon Ex. 105 (Lacey Direct), at 3; Verizon Initial Cost Brief at 35.

[309] Verizon Ex. 105, at 4-7; Verizon Initial Cost Brief at 35.

[310] Verizon Ex. 106 (Sovereign Direct), at 12-15; Verizon Initial Cost Brief at 42.

[311] Verizon Ex. 106, at 15-16. Verizon does not rely on this study as the basis for its proposed asset lives. Rather, it refers to the study only in an attempt to demonstrate the reasonableness of its own proposal. Verizon Reply Cost Brief at 22.

[312] Verizon Ex. 114 (Sovereign Rebuttal), at 4; Verizon Initial Cost Brief at 37-39.

[313] Verizon Ex. 106, at 5-7; Verizon Initial Cost Brief at 38-39.

[314] Verizon Ex. 111, at 12-14.

[315] *Id.* at 14-15.

[316] *Id.* at 14.

[317] *Id.* at 16; Tr. at 3173.

economic depreciation of capital goods,[318] Verizon itself does not use such a mark-up in running its cost models or the MSM, nor does it use an accelerated depreciation mechanism that would more accurately reflect the effect of declining equipment prices.

110. In response, AT&T/WorldCom argue that the proposal advanced by Dr. Hausman here is conceptually the same as the proposal he made on behalf of the United States Telephone Association in 1996, which was rejected by the Commission in the *Local Competition First Report and Order*.[319] According to AT&T/WorldCom, its model uses forward-looking asset lives that reflect the technology and competition risks faced by Verizon, and there is no need for any additional mark-up to protect Verizon against the risk of under-recovery.[320]

111. AT&T/WorldCom explain that the regulatory lives reflected in the MSM were forward-looking at the time the Commission adopted them, and the continued growth in incumbent LEC depreciation reserves suggests that those lives are more than adequate to reflect the impact of competition and technology in the current environment.[321] AT&T/WorldCom argue that the intensity of competition does not change the useful life of the asset,[322] and that the ability to provide wholesale service through UNEs actually extends the life of an asset that otherwise might be stranded as a result of facilities-based competition.[323] AT&T/WorldCom state that lives based on GAAP are inappropriate because GAAP is based on the principle of conservatism, which requires accountants to err on the side of using shorter lives (thereby increasing costs) in order to protect investors.[324]

3. Discussion

112. Based on the record before us, we agree with AT&T/WorldCom that FCC regulatory lives should be used for purposes of calculating UNE prices. We adopt one modification to AT&T/WorldCom's proposal, however. Specifically, we will use asset lives at the low end of the "safe harbor" range prescribed by the Commission in 1994 and 1995, and

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[318] Verizon Ex. 111, at 14-15. Hausman also suggests a mark-up is needed to account for the effect of risk and uncertainty on sunk and irreversible investments. *Id.* at 15-17.

[319] AT&T/WorldCom Ex. 20 at 18-19 (citing *Local Competition First Report and Order*, 11 FCC Rcd at 15849, para. 686).

[320] *Id.* at 26-27.

[321] AT&T/WorldCom Ex. 3 (Lee Direct), at 6-8 (explaining how the shift to forward-looking projection lives has resulted in increased depreciation reserves); AT&T/WorldCom Initial Cost Brief at 95-96.

[322] AT&T/WorldCom Initial Cost Brief at 105.

[323] AT&T/WorldCom Ex. 9 (Lee Rebuttal), at 14-15; Tr. at 3362-62.

[324] AT&T/WorldCom Ex. 9, at 4-6; AT&T/WorldCom Initial Cost Brief at 97-101.

modified in 1999,[325] rather than the lives prescribed by the Commission for Verizon in Virginia in 1994. The safe harbor lives represent the Commission's most recent assessment of the forward-looking asset lives for each of the accounts. As explained below, we choose the low end of the safe harbor to be consistent with the competition and technology assumptions required under the Commission's TELRIC rules.

113. We find that AT&T/WorldCom's proposal to use the asset lives prescribed by the Commission for Verizon in 1994 is not the best approach. In certain cases, the asset lives proposed by AT&T/WorldCom are too long to be consistent with the forward-looking principles upon which TELRIC is based. For example, they propose a 17-year life for digital switching equipment. Given that the Commission has allowed incumbent LECs to use a life as short as 12 years under the safe harbor, and as short as 10 years based on specific evidence presented by a carrier,[326] a 17-year life is inconsistent with forward-looking principles. Instead, Verizon should use the 12-year life that is the low end of the FCC safe harbor range.[327]

114. Our determination to use FCC regulatory lives applies only where there is a dispute between the parties as to the appropriate asset life. In cases where the parties agree (*e.g.*, a 30-year life for poles), there is no dispute for us to resolve. Similarly, we will adopt Verizon's proposal with respect to salvage percentages because it was not challenged by AT&T/WorldCom.[328] We note that there is no safe harbor range for buildings. Consequently, we will use the economic life of 46.93 years that the Commission used in the *Inputs Order*.[329] A complete list of the asset lives and salvage percentages to be used in establishing rates in this proceeding is found in Appendix A to this order.

115. We reject Verizon's argument that FCC regulatory lives are not sufficiently forward-looking. The Commission has used forward-looking asset lives for some time in its regulation of incumbent LEC depreciation practices, and the asset lives that we adopt here are the most recent ones prescribed by the Commission. While Verizon asserts generally that technological advances and increased competition justify the use of shorter lives, it provides no

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[325] *See Simplification of the Depreciation Prescription Process*, CC Docket No. 92-296, Second Report and Order, 9 FCC Rcd 3206 (1994); *Simplification of the Depreciation Prescription Process*, CC Docket No. 92-296, Third Report and Order, 10 FCC Rcd 8442 (1995). The Commission modified the range for digital switching in 1999. *See Biennial Review Depreciation Order*, 15 FCC Rcd at 247-48, para. 13.

[326] *See Prescription of Revised Percentages of Depreciation Pursuant to the Communications Act of 1934, As Amended, for GTE North, Inc./GTE South, Inc.*, FCC 99-369, Memorandum Opinion and Order, 15 FCC Rcd 1755 (1999); Verizon Ex. 114, at 9. Although the Commission allowed GTE to use a 10-year life for digital switches, we explain below that Verizon has not provided specific evidence in this proceeding that would justify the use of asset lives outside the safe harbor range.

[327] *See Biennial Review Depreciation Order*, 15 FCC Rcd at 247-48, para. 13.

[328] AT&T/WorldCom Ex. 9, at 2.

[329] *See Inputs Order*, 14 FCC Rcd at 20391, App. A, Part 3 (Capital Costs).